Amendments to the Claims

The listing of claims will replace all prior versions, and listings of claims in the application.

1. (Currently amended) A method for receiving an optical data signal, ~~comprising the steps of:~~ comprising:

(1) receiving an optical data signal;

(2) converting the optical data signal to an electrical signal having a symbol rate;

(3) ~~converting the electrical signal to a digital electrical signal; and~~ generating N sampling signals having a first frequency that is lower than the symbol rate, the N sampling signals shifted in phase relative to one another;

(4) ~~digitally processing the digital electrical signal.~~ controlling N analog-to-digital converter ("ADC") paths with the N sampling signals to sample the electrical signal at the phases, so as to produce samples;

(5) performing one or more M-path parallel digital processes on the samples, wherein M=kN, and k is an integer or a number in the form of 1/s, where s is an integer; and

(6) generating a digital signal representation of the optical data signal from the samples.

2. (Currently amended) The method according to claim 1, wherein step ([[4]] 5) comprises ~~the step of equalizing the digital electrical signal.~~ performing an equalization process on the samples.

3. (Currently amended) The method according to claim 2, wherein step ([[4]] 5) further comprises ~~the step of~~ performing a Viterbi equalization process on the ~~digital electric signal.~~ samples.

4. (Currently amended) The method according to claim 2, wherein step ([[4]] 5) further comprises ~~the step of~~ performing a feed-forward equalization process on the ~~digital electric signal.~~ samples.

5. (Currently amended) The method according to claim 2, wherein step ([[4]] 5) further comprises ~~the step of~~ performing a decision feedback equalization process on the ~~digital electric signal.~~ samples.

6. (Currently amended) The method according to claim 2, wherein step ([[4]] 5) further comprises ~~the step of~~ performing Viterbi equalization and feed-forward equalization processes on the ~~digital electric signal.~~ samples.

7. (Currently amended) The method according to claim 2, wherein step ([[4]] 5) further comprises ~~the step of~~ performing Viterbi equalization and decision feedback equalization processes on the ~~digital electric signal.~~ samples.

8. (Currently amended) The method according to claim 2, wherein step ([[4]] 5) further comprises ~~the step~~
performing one or more of the following types of equalization processes on the ~~digital electric signal.~~ samples:

Viterbi equalization;
feed-forward equalization; and
decision feedback equalization.

9. (Currently amended) An optical receiver, comprising:

~~an~~ a receiver input;

an optical-to-electrical converter coupled to the receiver ~~said~~ input;

an analog-to-digital converter ("ADC") array of N ADC paths, wherein N is an integer greater than 1, each ~~said~~ ADC path including an ADC path input coupled to an output of the ~~said~~ optical-to-electrical converter; and

an M-path digital signal processor coupled to the ~~said analog-to-digital converter.~~ ADC array, wherein M=kN and k is an integer or a number in the form of 1/s, where s is an integer.

10. (Currently amended) The optical receiver according to claim 9, wherein the ~~said~~ digital signal processor includes an equalizer.

11. (Currently amended) The optical receiver according to claim 10, wherein the ~~said~~ equalizer comprises a Viterbi equalizer.

12. (Currently amended) The optical receiver according to claim ~~8~~ 10, wherein the ~~said~~ equalizer comprises a feed-forward equalizer.

13. (Currently amended) The optical receiver according to claim ~~8~~ 10, wherein the ~~said~~ equalizer comprises a decision feedback equalizer.

14. (Currently amended) The optical receiver according to claim ~~8~~ 10, wherein the ~~said~~ equalizer comprises a Viterbi equalizer and a feed-forward equalizer.

15. (Currently amended) The optical receiver according to claim ~~8~~ 10, wherein the ~~said~~ equalizer comprises a Viterbi equalizer and a decision feedback equalizer.

16. (Currently amended) The optical receiver according to claim ~~8~~ 10, wherein the ~~said~~ equalizer comprises a feed-forward equalizer and a decision feedback equalizer.

17. (Currently amended) The optical receiver according to claim ~~8~~ 10, wherein the ~~said~~ equalizer comprises one or more of:

a Viterbi equalizer;
a feed-forward equalizer; and
a decision feedback equalizer.

18. (Currently amended) An optical receiver, comprising:

means for receiving an optical data signal;

means for converting the optical data signal to an electrical signal having a symbol rate;

means for ~~converting the electrical signal to a digital electrical signal; and~~ generating N sampling signals having a first frequency that is lower than the symbol rate, the N sampling signals shifted in phase relative to one another;

means for ~~digitally processing the digital electrical signal.~~ controlling N analog-to-digital converter ("ADC") paths with the N sampling signals to sample the electrical signal at the phases to produce samples;

means for performing one or more M-path parallel digital processes on the samples, wherein M=kN, and k is an integer or a number in the form of 1/s, where s is an integer; and

means for generating a digital signal representation of the optical data signal from the samples.

19. (Currently amended) The system according to claim 18, wherein the ~~said~~ means for performing digital processes on the samples ~~digitally processing the digital electrical signal~~ include means for equalizing the ~~digital electrical signal.~~ samples.

20. (Currently amended) The system according to claim 19, wherein the ~~said~~ means for equalizing the ~~digital electrical signal~~ samples comprise means for performing a Viterbi equalization process on the ~~digital electrical signal.~~ samples.

21. (Currently amended) The system according to claim 19, wherein the ~~said~~ means for equalizing the ~~digital electrical signal~~ samples comprise means for performing a feed-forward equalization process on the ~~digital electrical signal.~~ samples.

22. (Currently amended) The system according to claim 19, wherein the ~~said~~ means for equalizing the ~~digital electrical signal~~ samples comprise means for performing a decision feedback equalization process on the ~~digital electrical signal.~~ samples.

23. (Currently amended) The system according to claim 19, wherein the ~~said~~ means for equalizing the ~~digital electrical signal~~ samples comprise means for performing Viterbi equalization and feed-forward equalization processes on the ~~digital electrical signal.~~ samples.

24. (Currently amended) The system according to claim 19, wherein the ~~said~~ means for equalizing the ~~digital electrical signal~~ samples comprises means for performing Viterbi equalization and decision feedback equalization processes on the ~~digital electrical signal.~~ samples.

25. (Currently amended) The method according to claim ~~1~~ 2, wherein step (1) comprises ~~the step of~~ receiving the optical data signal from a multimode optical fiber and step ([[4]] 5) comprises ~~the step of~~ equalizing multimode dispersion from the multimode optical fiber.

26. (Currently amended) The method according to claim ~~1~~ 2, wherein step (1) comprises ~~the step of~~ receiving the optical data signal from a single mode optical fiber and step ([[4]] 5) comprises ~~the step of~~ equalizing chromatic and/or waveguide dispersion from the single mode optical fiber.

27. (Currently amended) The method according to claim ~~1~~ 2, wherein step (1) comprises ~~the step of~~ receiving the optical data signal from a multimode optical fiber and step ([[4]] 5) comprises ~~the step of~~ equalizing chromatic and/or waveguide dispersion from the multimode optical fiber.

28. (Currently amended) The method according to claim ~~1~~ 2, wherein step (1) comprises ~~the step of~~ receiving the optical data signal from a single mode optical fiber and step ([[4]] 5) comprises ~~the step of~~ equalizing polarization mode dispersion from the single mode optical fiber.

29. (Currently amended) The method according to claim ~~1~~ 2, wherein step (1) comprises ~~the step of~~ receiving the optical data signal from a single mode optical fiber and step ([[4]] 5) comprises ~~the step of~~ equalizing dispersion induced in the single mode optical fiber by laser chirping.

30. (Currently amended) The method according to claim ~~1~~ 2, wherein step (1) comprises ~~the step of~~ receiving the optical data signal from a transmitter that lacks external modulators, and step ([[4]] 5) comprises ~~the step of~~ equalizing excess dispersion induced by laser chirping.

31. (Currently amended) The optical receiver according to claim 10, wherein the ~~said~~ input is coupled to a multimode optical fiber and the ~~said~~ equalizer equalizes multimode dispersion from the multimode optical fiber.

32. (Currently amended) The optical receiver according to claim 10, wherein the ~~said~~ input is coupled to a single mode optical fiber and the ~~said~~ equalizer equalizes chromatic and/or waveguide dispersion from the single mode optical fiber.

33. (Currently amended) The optical receiver according to claim 10, wherein the ~~said~~ input is coupled to a multimode optical fiber and the ~~said~~ equalizer equalizes chromatic and/or waveguide dispersion in the multimode optical fiber.

34. (Currently amended) The optical receiver according to claim 10, wherein the ~~said~~ input is coupled to a multimode optical fiber and the ~~said~~ equalizer equalizes polarization mode dispersion from the single mode optical fiber.

35. (Currently amended) The optical receiver according to claim 10, wherein the ~~said~~ input is coupled to a single mode optical fiber and the ~~said~~ equalizer equalizes dispersion induced in the single mode optical fiber by laser chirping.

36. (Currently amended) The optical receiver according to claim 10, wherein the ~~said~~ input receives the optical data signal from a transmitter that lacks external modulators, and the ~~said~~ equalizer equalizes excess dispersion induced by laser chirping.

37. (Currently amended) The optical receiver according to claim 19, wherein the ~~said~~ means for receiving an optical signal is coupled to a multimode optical fiber and the ~~said~~ means for equalizing comprises means for equalizing multimode dispersion from the multimode optical fiber.

38. (Currently amended) The optical receiver according to claim 19, wherein the ~~said~~ means for receiving an optical signal is coupled to a single mode optical fiber and the ~~said~~ means for equalizing comprises means for equalizing chromatic and/or waveguide dispersion from the single mode optical fiber.

39. (Currently amended) The optical receiver according to claim 19, wherein the ~~said~~ means for receiving an optical signal is coupled to a multimode optical fiber and the ~~said~~ means for equalizing comprises means for equalizing chromatic and/or waveguide dispersion in the multimode optical fiber.

40. (Currently amended) The optical receiver according to claim 19, wherein the ~~said~~ means for receiving an optical signal is coupled to a multimode optical fiber and the ~~said~~ means for equalizing comprises means for equalizing polarization mode dispersion from the single mode optical fiber.

41. (Currently amended) The optical receiver according to claim 19, wherein the ~~said~~ means for receiving an optical signal is coupled to a single mode optical fiber and the ~~said~~ means for equalizing comprises means for equalizing dispersion induced in the single mode optical fiber by laser chirping.

42. (Currently amended) The optical receiver according to claim 19, wherein the ~~said~~ means for receiving an optical signal receives the optical data signal from a transmitter that lacks external modulators, and the ~~said~~ means for equalizing comprises means for equalizing excess dispersion induced by laser chirping.

43. (Currently amended) The method according to claim 1, wherein step ([[4]] 5) comprises ~~the step of~~ decoding a convolutional code.

44. (Currently amended) The method according to claim 1, wherein step ([[4]] 5) comprises ~~the step of~~ decoding a trellis code.

45. (Currently amended) The method according to claim 1, wherein step ([[4]] 5) comprises ~~the step of~~ decoding a block code.

46. (Currently amended) The optical receiver according to claim 9, wherein the ~~said~~ digital signal processor comprises a convolutional decoder.

47. (Currently amended) The optical receiver according to claim 9, wherein the ~~said~~ digital signal processor comprises a trellis decoder.

48. (Currently amended) The optical receiver according to claim 9, wherein the ~~said~~ digital signal processor comprises a block decoder.

49. (Currently amended) The optical receiver according to claim 18, wherein the ~~said~~ means for performing digital processes on the samples ~~digitally processing the digital electrical signal~~ comprises means for decoding a convolutional code.

50. (Currently amended) The optical receiver according to claim 18, wherein the ~~said~~ means for performing digital processes on the samples ~~digitally processing the digital electrical signal~~ comprises means for decoding a trellis code.

51. (Currently amended) The optical receiver according to claim 18, wherein the ~~said~~ means for digitally performing digital processes on the samples ~~digitally processing the digital electrical signal~~ comprises means for decoding a block code.